

laboratory work in both the elementary and advanced classes is accompanied with lectures twice a week upon topics similar to the following:

Structure of, and useful plants in, Polypetalous, Monopetalous and Apetalous divisions.

Same in regard to Gymnosperms.

Morphology of Bracts, and an examination of inflorescence.

Morphology of calyx, corolla, stamens, carpels, ovules, seeds and fruits.

Movements in plants.

General laws of adaptation in the vegetable world.

Plants of former times.

Plants of extremes of climate.

Plants of the temperate zones.

General laws of plant distribution.

Relation of plant structure to functions.

Relation of plants to water; percentage of water in composition; root absorption; absorption by other parts; transpiration and its results; selection of dissolved salts and their appropriation by the plants.

Soil, its physical and chemical structure.

Relation of plants to the atmosphere; gaseous absorption; transfer of gases in plants.

Assimilation; structure of the leaf; chlorophyll, its properties; relation to light; products of assimilation; effects on the air; storing up of elaborated products.

Metastasis; changes which elaborated products undergo in the plant.

Production of active principles; relations of this to heat.

Respiration in plants.

Nitrogenous food; insectivorous plants.

Phenomena of growth.

Laws of growth.

Movements; autonomic; following shocks; associated with growth.

Buds and their transfer.

Fertilization in gymnosperms.

Fertilization in angiosperms; color, fragrance, etc., in flowers.

Fertilization; close, cross and hybridization.—J. TROOP.

### Remarks on *Dentaria* as a Subgenus of *Cardamine*.

Bentham and Hooker in their "Genera Plantarum" have united *Dentaria* with *Cardamine*, arranging the species of the former as a subgenus under the latter. This, with our species, was done by Alphonso Wood in his "Botanist and Florist" in 1870, and he is credited with the names under *Cardamine*.

The only differences between the two genera, at least so far as

our species go, are in habit, the stems of the first being generally naked below and the second being leafy, and in the seeds of *Dentaria* being on broad, and of *Cardamine* on slender stalks.

The species of the eastern United States are in need of revision and the following is submitted to the consideration of botanists.

1. *CARDAMINE DIPHYLLA*, Wood. Rootstock long and continuous; toothed; stem leaves two.

2. *CARDAMINE HETEROPHYLLA*, Wood. Rootstock interrupted, forming a chain of two or three narrow oblong toothed tubers; stem leaves two to seven, mostly three, alternate.—The forms with more than three leaves are *Dentaria maxima*, Nutt.

This and the next species it would sometimes be hard to separate, for the next is sometimes found with two leaves, and sometimes with three and these alternate instead of whorled.

3. *CARDAMINE LACINIATA*, Wood. Rootstock same as last; leaves mostly three in a whorl, sometimes only two.

Var. *MULTIFIDA*, James. Leaves two or three, alternate or whorled, the leaflets with narrow linear lobes.

I do not think this form, called *Dentaria multifida*, Muhl., can be separated with justice from the *laciniata*. In a recent trip to Lookout mountain, Chattanooga, I found both forms in full bloom, although not growing together, and some were so exactly intermediate in the division of the leaflets that it was hard to decide what they were. The rootstocks of both are alike. The variety however grows in poorer soil than the species itself, and we can thus account for the finer division of the leaves. To take the extreme form of the species and the variety and compare them, one would be inclined to give to each specific rank, but when we find them shading into one another as gradually as they do, we can see no other plan than to consider the *multifida* as a variety of *C. laciniata*.

The other species of *Dentaria* of the United States will now be *Cardamine Californica*, *C. macrocarpa*, and *C. tenella*.

I have specimens of var. *multifida* and many other specimens for exchange for my desiderata.—Jos. F. JAMES, Custodian Cin. Soc. Nat. Hist., Cin. O.

## GENERAL NOTES.

*Viola Beckwithii*, T. & G., var. *trinervata*.—This pretty little violet was first collected near Goldendale, Wash. Terr., April 1, 1878, and at different times since, and has been distributed in my sets as *V. Beckwithii*, var. The characters of this new variety may eventually entitle it to specific rank, but for the present it is retained under *V. Beckwithii*. The principal characters are in the more simply pedate leaves, with broader lobes, having remarkable callous tips, and three prominent nerves, very strong in the mature leaves, the lateral pair submarginal, sometimes five nerves, when the outermost are strictly marginal.—

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